IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.   : 10/699,766

Applicant   : Albert Sun *et al.*

Filed   : November 3, 2003

TC/A.U.   : 2186

Examiner   : PATEL, HETUL B

Docket No.   : P900383

Customer No.   : 33197

Confirmation No.   : 4242

Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

DECLARATION UNDER 37 C.F.R. 1.131

I, Albert Sun, Eric Sheu, and Shih-Liang Chen, declare as follows:

I am an inventor of the claims of the above-identified patent application.

Prior to May 24, 2002, I conceived the invention to a level of detail ready for patenting, as evidenced, for example, by pages 4-6 and 8-10 of the attached Exhibit, of an integrated circuit comprising a configurable logic array having a programmable non-volatile configuration defined by configuration data stored in electrically programmable configuration points within the configurable logic array; a programmable configuration memory, adapted to store the

configuration data; memory adapted to store instructions for a mission function for the integrated circuit, and to store instructions for a configuration function used to transfer the configuration data from the programmable non-volatile configuration memory to the programmable configuration points within the configurable logic array; and a processor coupled to the memory which fetches and executes instructions from the memory, as described and claimed in the above-identified application.

The attached Exhibit illustrating my invention was prepared by me before May 24, 2002. The Exhibit document was subsequently transmitted to HAYNES BEFFEL & WOLFELD, LLP for preparation and filing of an application for patent in the United States.

The below undersigned declares that all statements made of his own knowledge are true and that all statements made on information and belief are believed to be true, being duly warned that willful false statements and the like are punishable by fine or imprisonment, or both, (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing therefrom.

MAR 26 2008
_____

Date

Albert Sun

MAR 26 2008
_____

Date

Eric Sheu

MAR 26 2008
_____

Date
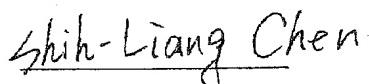
Shih-Liang Chen

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INVENTION DISCLOSURE FORM

(專利提案揭露書)

(Please fill out this form following the instructions in English or Chinese)

☐自撰☐代撰:【Mark】(請填入事務所)

Title of this invention (本發明名稱)		
中　　文	藉由重置記憶體之嵌入式快閃記憶體式可程式邏輯元件之電路重置
English	In-Circuit Configuration for embedded Flash-Based Programmable Logic Device through configuration memory on a chip

Content (目錄)

1. Inventors Information　(發明人基本資料)

2. **Summary of the technical characteristics about this invention.**
   (簡述本發明之技術重點)

3. **Comparing prior patents or other prior arts with this invention.**
   (本發明與專利前案或其他先前技術(非專利)之比較)

4. Brief describing the best mode embodiment of this invention.　(詳述本發明之最佳實施例)

5. Describing any possible modification or variation of this invention.
   (說明本發明任何可能之變化或修改)

6. Describing how the invention achieves the objects of the invention.
   (說明本發明的元件或步驟特點，何以達到發明目的)

7. Drafting the protective scope of the invention (claims) using the essential elements or steps of the invention.
   (試以最少必要元件或步驟，研擬本發明之保護範圍，注意請勿使用「單句式」)

8. Showing related drawings or experimental data about this invention.
   (示出本發明相關之圖式或實驗數據。註：此並非申請專利之絕對必要。)

9. Witnesses Information　(見證人資料)

(如需增頁，請自行複製本空白表單，並確定每頁均簽上姓名及日期)

發明人簽名：_____　　_____　　_____　　_____　　_____

INVENTION DISCLOSURE FORM

MXIC

(專利提案揭露書)
(Please fill out this form following the instructions in English or Chinese)

1. Inventor (發明人)(請依貢獻比例順序填寫)

Chinese Name (中文姓名)	ID No. (身分證號碼)	Citizenship (國籍)	Department (部門)	Ext. No. (分機)	Contribution (貢獻比例%)	Signature (簽名)	
	English Name (英譯姓名/同護照)	Address (中/英文地址並列)					
孫駿恭	F101926929	US	ED500	5520	35%		
	Albert Sun	新竹市湖濱二路 37 號 3 樓 3 F, No. 37, Waterfront Road II, Science-Based Industrial Park, Hsunchu.					
許志銘	R121054343	TW	NA	NA	35%		
	Eric Sheu	新竹市科學園區研新 3 路 3 號 No. 3, Creation Road III, Science-Based Industrial Park, Hsunchu.					
陳世梁	M121479579	TW	ED500	5587	30%		
	Shih-Liang Chen	豐原市三村路 122 巷 3 號 No. 3, 122 Lane, San-tsun Road, Fengyuan					

Remark :1. The inventors should have a substantial contribution to the idea of this invention. The inventor should propose or make a modification at least one element on this invention. One merely offering a consultation, experimentation, operation, or auxiliary work is not qualified.
(具發明人資格者，應為對本發明特徵範圍之「構想」具有實質貢獻者，發明人至少須提出或改良本發明一項構件以上，單純的諮詢、實驗、操作、或輔助工作等，不能列為發明人)

2. In order to preserve Macronix's right to patent this invention, descriptions of your invention should be treated as MXIC confidential. This invention should only be disclosed to non-Macronix employees under a approved and executed Non-Disclosure Agreement (NDA).
(為確保旺宏申請專利之權利，本發明之內容應屬機密，未經允許或簽訂保密合約(NDA)者，不得揭示於任何非相關人員或非旺宏員工)

3. Any publication, disclosure without an NDA, sale of this invention prior to file a patent application will be deemed as the prior art of this invention and make this invention devoid of novelty or a granted patent invalid.
(在本發明提出專利申請之前的任何公開、未經 NDA 之發表、上市銷售、或相關產品文件之散佈，都會

(如需增頁，請自行複製本空白表單，並確定每頁均簽上姓名及日期)

發明人簽名：＿＿＿＿＿＿　　＿＿＿＿＿＿　　＿＿＿＿＿＿　　＿＿＿＿＿＿　　＿＿＿＿＿

INVENTION DISCLOSURE FORM

(專利提案揭露書)

(Please fill out this form following the instructions in English or Chinese)

被視為本發明之先前技藝，而使本發明喪失新穎性，並有可能使獲准之專利無效)

(如需增頁，請自行複製本空白表單，並確定每頁均簽上姓名及日期)

發明人簽名：_____　　_____　　_____　　_____　　_____

INVENTION DISCLOSURE FORM

(專利提案揭露書)

(Please fill out this form following the instructions in English or Chinese)

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2. Summary of the technical characteristics about this invention. （簡述本發明之技術重點）

In-circuit configuration for embedded programmable logic device (PLD) is important for SOC era.

This invention describe how to implement in-circuit configuration for flash-based programmable logic device.

The elements of this invention include configuration data memory(stored in RAM or flash), configuration handler(stored in ROM or Flash), micro controller, PLD control circuitry and flash-based PLD.

Through the above elements, the in-circuit configuration for flash based PLD could be achieved.

發明人簽名：_____　　_____　　_____　　_____　_____

INVENTION DISCLOSURE FORM

(專利提案揭露書)

(Please fill out this form following the instructions in English or Chinese)

3. Comparing prior arts with this invention. (本發明與先前技術之比較)

Describing summary and disadvantages of each prior Patents or other prior arts (Besides Patent), and comparing with this invention.

(簡述各專利前案或其他先前技術(非專利)之缺點及其與本發明之比較)

Remark: In the course of patent application, the inventor must submit any acknowledged prior art or related disclosures. Otherwise, a granted patent may be canceled. (依美國專利法之規定，在專利申請過程中，發明人必須陳報任何已知之前案或相關資料。否則，獲准之專利有可能會被取消)

| Patent No or Prior arts (專利號或 先前技術名稱)	Summary and advantages of prior patents or other prior arts (專利前案或其他先前技術之簡述及其缺點)	Difference from this invention (與本發明之差異)
5901330	An architecture for an integrated circuit with in-circuit programming Include a micro controller on an integrated circuit and one or more banks of non-volatile memory which store instructions, including an in-circuit programming(ICP) set of instructions.	Integrate configuration data memory (RAM or flash) for embedded flash based PLD configuration on a chip. Configuration data memory could be programmed or written using configuration handler, control circuitry and micro controller through external ports. Flash-based PLD could be configured using configuration handler, micro controller, PLD control circuitry, configuration data memory.

(如需增頁，請自行複製本空白表單，並確定每頁均簽上姓名及日期)

發明人簽名：＿＿＿＿＿＿＿＿　　＿＿＿＿＿＿＿＿　　＿＿＿＿＿＿＿＿　　＿＿＿＿＿＿＿＿　＿＿＿＿＿＿＿

INVENTION DISCLOSURE FORM

4. Brief describing the best mode embodiment of this invention. （詳述本發明最佳實施例）

(若為 1.電子案：須作電路元件、方塊圖、電路原理之說明；2.若涉及軟體：須提供軟體流程及相關說明；3.若為機構案：須描繪其個別元件、組合圖，並作裝置動作、效果說明；4.若為製程案：須作對應於流程之剖面圖及其說明)
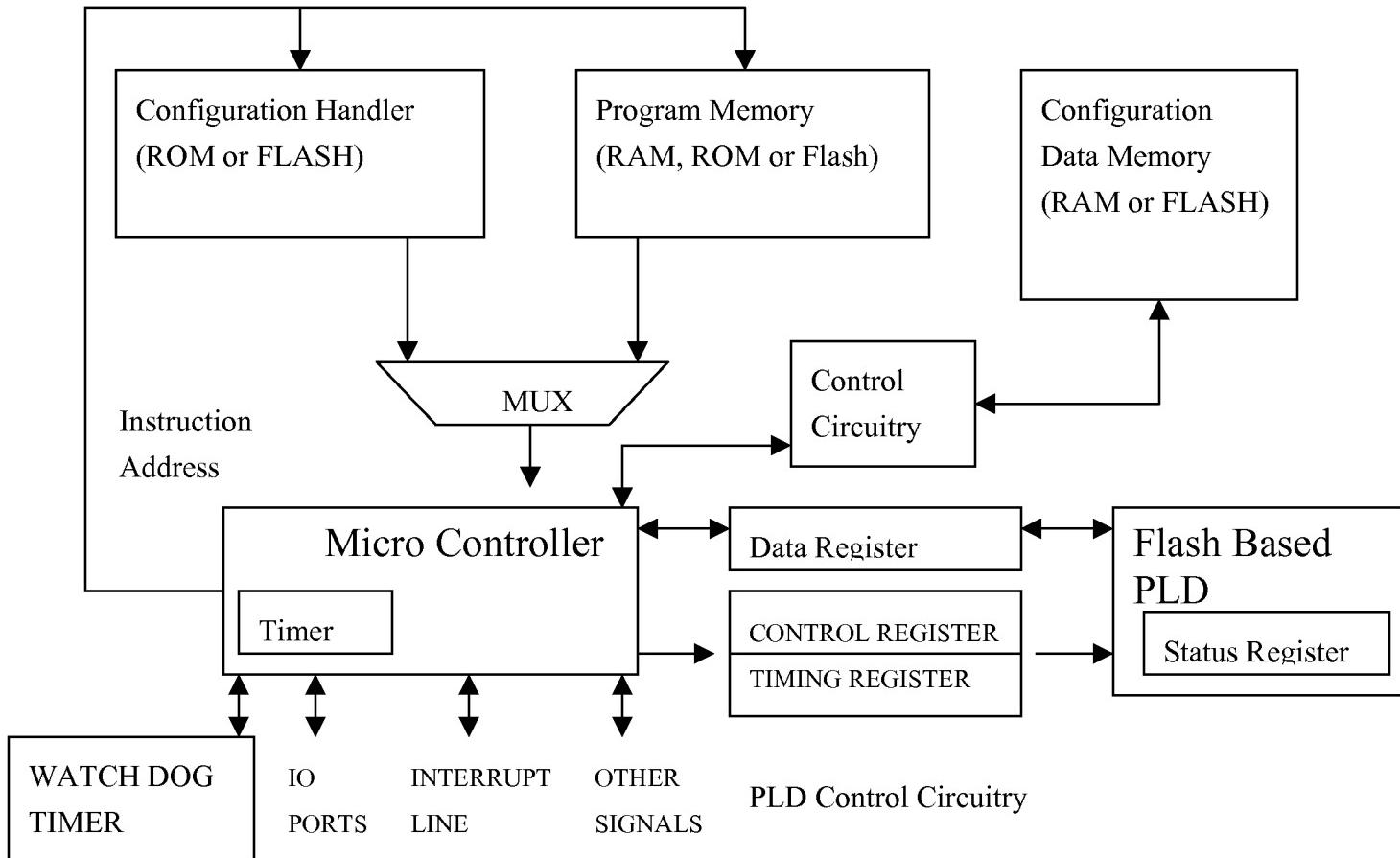
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┌─────────────────────┐   ┌─────────────────────┐   ┌─────────────────────┐
│ Configuration       │   │ Program Memory      │   │ Configuration       │
│ Handler             │   │ (RAM, ROM or Flash) │   │ Data Memory         │
│ (ROM or FLASH)      │   │                     │   │ (RAM or FLASH)      │
└─────────────────────┘   └─────────────────────┘   └─────────────────────┘

                    ╲_____MUX_____╱          ┌──────────────┐
  Instruction                                │ Control      │
  Address                                    │ Circuitry    │
                                             └──────────────┘

  ┌─────────────────────────────┐   ┌─────────────────┐   ┌─────────────────┐
  │ Micro Controller            │←→ │ Data Register   │←→ │ Flash Based     │
  │  ┌──────────┐               │   ├─────────────────┤   │ PLD             │
  │  │ Timer    │               │   │ CONTROL REGISTER│   │ ┌─────────────┐ │
  │  └──────────┘               │   │ TIMING REGISTER │ → │ │Status Reg.  │ │
  └─────────────────────────────┘   └─────────────────┘   │ └─────────────┘ │
                                                          └─────────────────┘

┌──────────────┐  IO      INTERRUPT  OTHER
│ WATCH DOG    │  PORTS   LINE       SIGNALS      PLD Control Circuitry
│ TIMER        │
└──────────────┘
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發明人簽名：_____ _____ _____ _____ _____

![MXIC logo]

INVENTION DISCLOSURE FORM

代撰編號：_____
提案編號：_____

(專利提案揭露書)
(Please fill out this form following the instructions in English or Chinese)

5. Describing any possible modification or variation of this invention.
(說明本發明任何可能之變化或修正)

發明人簽名：_____　　_____　　_____　　_____　_____

INVENTION DISCLOSURE FORM

(專利提案揭露書)
(Please fill out this form following the instructions in English or Chinese)

6. Describing how the invention achieves the objects of the invention.
(說明本發明何以達到發明目的)

Integrate configuration data memory (RAM or flash) for embedded flash based PLD configuration on a chip.

Configuration data could be programmed or written using configuration handler, control circuitry and micro controller through external ports.

Flash-based PLD could be configured using configuration handler, micro controller, PLD control circuitry, configuration data memory.

發明人簽名：_____　　_____　　_____　　_____　_____

7. Drafting the protective scope of the invention (claims) using the essential elements or steps of the invention. (試以最少必要元件或步驟之原則，研擬本發明之保護範圍)

An apparatus for in-circuit programming of an integrated circuit, comprising :

A processor on the integrated circuit which executes instructions;

An external port on the integrated circuit through which data is received from an external source;

A first memory array comprising non-volatile memory cells on the integrated circuit, which stores instructions for execution by the processor, including a set of instructions for controlling the transfer of instructions into the integrated circuit from the external source through the external port and instructions for execution by the processor, including a set of instructions for controlling the in-circuit programming steps of erasing, programming and verifying the data in programmable logic device.

A second memory, which stores configuration data for reconfiguration of embedded programmable logic device.

A programmable logic device for a configurable integrated circuit, comprising non-volatile cells on the integrated circuit, which could re-configure the logic function of logic device.

發明人簽名：_____   _____   _____   _____   _____

INVENTION DISCLOSURE FORM

(專利提案揭露書)

(Please fill out this form following the instructions in English or Chinese)

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8. Showing related drawings or experimental data about this invention.
(示出本發明相關之圖式或實驗數據)

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┌─────────────────────────┐   ┌─────────────────────────┐      ┌──────────────────┐
│ Configuration Handler   │   │ Program Memory          │      │ RAM              │
│ (ROM or FLASH)          │   │ (RAM, ROM or Flash)     │      │ FLASH            │
│                         │   │                         │      │ Configuration    │
│                         │   │                         │      │ Data             │
└─────────────────────────┘   └─────────────────────────┘      └──────────────────┘
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MUX

Control Circuitry

Instruction Address

Micro Controller

Timer

Data Register

Flash Based PLD

CONTROL REGISTER

TIMING REGISTER

Status Register

WATCH DOG TIMER

IO PORTS

INTERRUPT LINE

OTHER SIGNALS

PLD Control Circuitry

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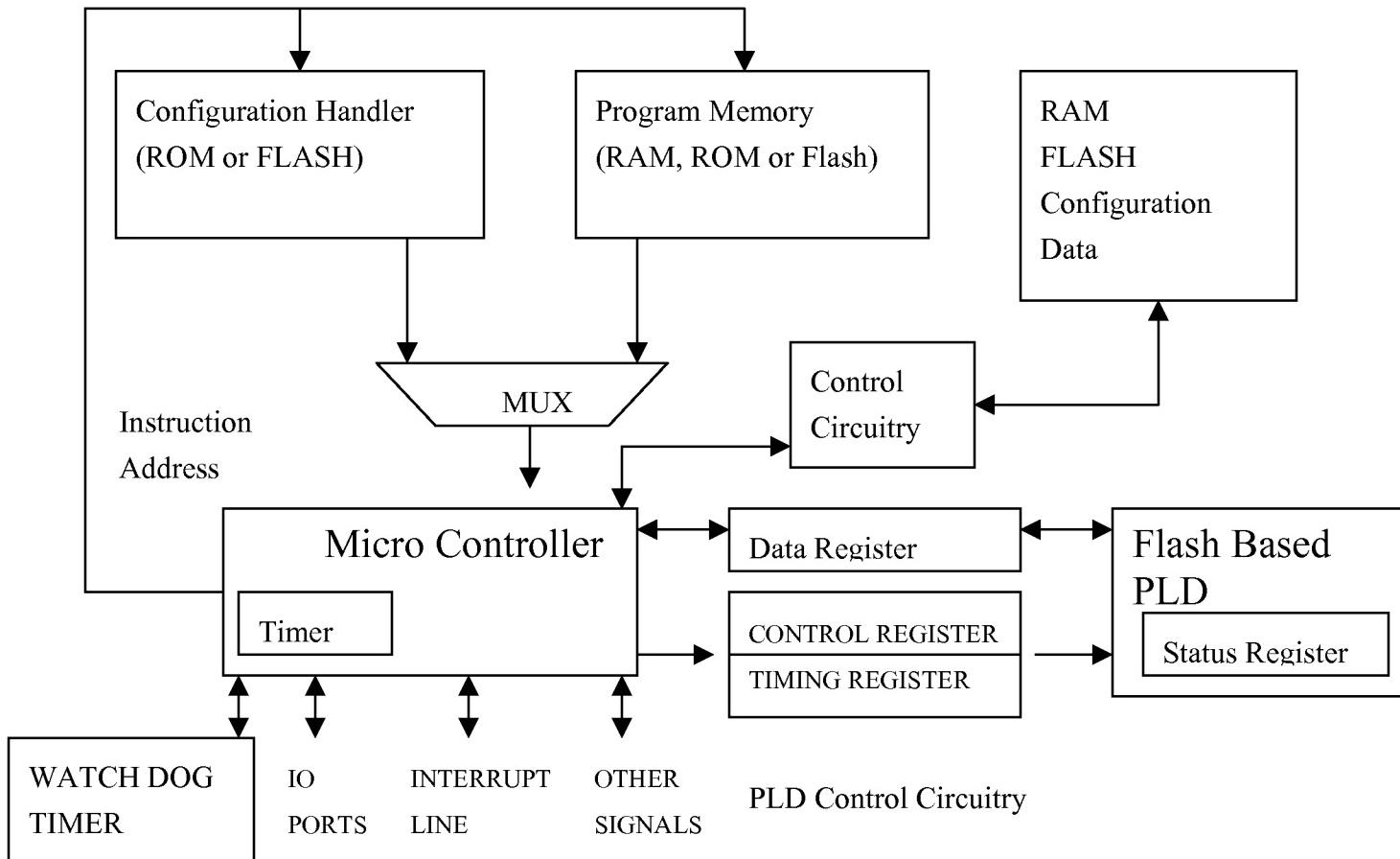
9. Witnesses : This Invention Disclosure Form consisting of ___ pages has been read and understood by
(見證人已詳讀本專利提案揭露書共 ___ 頁，並確實瞭解記載內容)

First Witness (第一人)		Second Witness (第二人)	
Signature (簽名)	Date (日期)	Signature (簽名)	Date (日期)

（如需增頁，請自行複製本空白表單，並確定每頁均簽上姓名及日期）

發明人簽名：_____   _____   _____   _____